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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,714	09/17/2003	Daijiro Inoue	57810-076	2234
7590 12/28/2005				
McDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096			EXAMINER SEFER, AHMED N	
			ART UNIT 2826	PAPER NUMBER

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/663,714

Applicant(s)

INOUE ET AL.

Examiner

A. Sefer

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-10,12 and 14-25 is/are pending in the application.
- 4a) Of the above claim(s) 8,10 and 17-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4,6,7,9,12,14-16 and 23-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/4/2005 has been entered and new claims 24 and 25 have been added.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 12 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation of claim 12 calling for "said first undoped optical guide layer is formed **only** between said **active** layer and said **second** nitride-based semiconductor layer in interspaces between said active layer and **said first** and second conductivity type **first** and second nitride-based semiconductor layers" is not well understood. It is not clear if the optical guide layer is formed **only** between said active layer and said second nitride-based semiconductor layer or if it is also formed in other regions of the device, in which the case the word **only** would not be necessary.

Claim 25 recites the limitation "the thickness of said first undoped optical layer". There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 6, 7, 9, 16 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Hata et al. ("Hata") US PG-Pub 2002/0190263.

The applied reference has a common assignee/inventor with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Hata discloses (fig. 10 and pars. 0181-0186) a nitride-based semiconductor light-emitting device comprising: a first conductivity type first nitride-based semiconductor layer 4 formed on a substrate or first conductivity GaN substrate (as in claim 23); an active layer 15, formed on said first nitride-based semiconductor layer; a first undoped optical guide layer 68 formed on said active layer; a second conductivity type second nitride-based semiconductor layer 67 consisting AlGaIn (as in claim 3) formed on said active layer; an undoped contact layer 69 having a

Art Unit: 2826

thickness (par. 0130) within the recited range and a band gap smaller than the band gap of said second nitride-based semiconductor layer (as in claim 2) formed on said second nitride-based semiconductor layer; and an electrode 10 formed on said undoped contact layer.

Regarding claim 4, Hata discloses a first conductivity type first nitride-based semiconductor layer being an n-type first nitride-based semiconductor layer, and said second conductivity type second nitride-based semiconductor layer being a p-type second nitride-based semiconductor layer.

Regarding claims 6 and 7, Hata discloses (par. 0185) said undoped contact layer containing InGaN (as in claim 7) having a band gap larger than the band gap of said active layer.

Regarding claim 9, Hata discloses undoped contact layer being constituted of a single undoped nitride-based semiconductor layer.

Regarding claim 16, Hata discloses (pars. 0081-0082) an active layer consisting of a nitride-based semiconductor containing In, said nitride-based semiconductor light-emitting device further comprising a protective layer 66 of a nitride-based semiconductor layer formed on said active layer.

The recitation calling “for preventing In contained in said active layer from desorption” attempts to distinguish the invention from the prior art in terms of function rather than structure. See *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971; *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4, 6, 7, 12, 14-16 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagahama et al. ("Nagahama") US PG-Pub 2005/0127394 in view of Tanizawa et al. ("Tanizawa") EP 1063711 (of record)

Nagahama discloses in fig. 2 a nitride-based semiconductor light-emitting device comprising: a first conductivity type first nitride-based semiconductor layer 14 formed on a substrate or first conductivity (par. 0198) GaN substrate (as in claim 23); an active layer 16, formed on said first nitride-based semiconductor layer; a first undoped optical guide layer 18 (par. 0137) formed on said active layer; a second conductivity type second nitride-based semiconductor layer 19 formed on said first undoped optical guide layer; a contact layer 20 formed on said second nitride-based semiconductor layer; and an electrode 21 formed on said contact layer, but lacks anticipation of an undoped contact layer wherein said undoped contact layer having a thickness.

Tanizawa discloses (figs. 1-5, 8 and pars. 0369 and 0370 and 0450-0455) a nitride-based semiconductor light-emitting device comprising: a first conductivity type first nitride-based semiconductor layer 205 formed on a substrate or first conductivity GaN substrate 203 (as in claim 23); an active layer 7, formed on said first nitride-based semiconductor layer; a second conductivity type second nitride-based semiconductor layer 108 consisting AlGaIn (par. 0449)

Art Unit: 2826

(as in claim 3); an undoped contact layer 208a (par. 0450) having a band gap smaller than the band gap of said second nitride-based semiconductor layer (as in claim 2) formed on said second nitride-based semiconductor layer; and an electrode 10 formed on said undoped contact layer, wherein said undoped contact layer has a thickness within the range recited in the claim (par. 00202 and 0450).

Therefore, in view of Tanizawa's teachings, one having an ordinary skill in the art at the time the invention was made would be motivated to modify Nagahama's device by incorporating an undoped contact layer having the specified thickness since that would prevent generation of fine cracks as taught by Nagahama.

Regarding claim 4, Tanizawa discloses a first conductivity type first nitride-based semiconductor layer being an n-type first nitride-based semiconductor layer, and said second conductivity type second nitride-based semiconductor layer being a p-type second nitride-based semiconductor layer.

Regarding claims 6 and 7, Tanizawa discloses said undoped contact layer containing InGaN (as in claim 7) having a band gap larger than the band gap of said active layer.

Regarding claim 12, as understood, Nagahama discloses (par. 0136) said first undoped optical guide layer nitride-based semiconductor layer 18 being formed only between said active layer 16 and said second nitride-based semiconductor layer 19 in the interspaces between said active layer and said first and second conductivity type first and second nitride-based semiconductor layers.

Regarding claim 14, Nagahama discloses said second conductivity type second nitride-based semiconductor layer including a second conductivity type second nitride-based

Art Unit: 2826

semiconductor layer consisting of AlGa<sub>N</sub> (par. 0139), and said first undoped optical guide layer consisting of Ga<sub>N</sub>.

Regarding claim 15, Nagahama discloses a second conductivity type second nitride-based semiconductor layer including a second conductivity type cladding layer 19 having a projection, said contact layer 20 being formed on the upper surface of said projecting portion of said second conductivity type cladding layer, and said projecting portion of said second conductivity type cladding layer and said contact layer constitute a ridge portion.

Regarding claim 16, Nagahama discloses an active layer consisting of a nitride-based semiconductor containing In (par. 0131), said nitride-based semiconductor light-emitting device further comprising a protective layer 17 (pars. 0134 and 0135) of a nitride-based semiconductor layer formed on said active layer.

The recitation calling “for preventing In contained in said active layer from desorption” attempts to distinguish the invention from the prior art in terms of function rather than structure. See *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971; *In re Danly*, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959).

Regarding claim 24, Nagahama discloses (par. 0130) a second undoped optical guide layer 15 formed between the first nitride base layer 14 and said active layer 16.

Regarding claim 25, Nagahama discloses (pars. 0130 and 0134) said second undoped optical guide layer having a thickness within the recited range.



Art Unit: 2826

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS  
December 16, 2005

NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
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